

Appendix F

Site-Specific COPC Screen for Soil, Groundwater, Sediment and Surface Water at the Willow/Hawthorne Former MGP Site

Contaminants of potential concern (COPC) for sites within the Integrys Multi-Site program can be found in Table 1 of the USEPA-approved Multi-Site Risk Assessment Framework (RAF) (provided in Appendix F, Attachment F-1). For the Willow/Hawthorne Operable Unit (OU), to address USEPA concerns regarding the potential presence of additional COPCs that are not listed on the Table 1 RAF list, a supplemental screening assessment has been performed. This additional assessment has been done to determine if any constituents should be added on a site-specific basis to the Multi-Site RAF COPC list. This assessment considers the results of previous on-site sampling and historic property uses.

This supplemental COPC assessment was performed for historic soil data using the following screening techniques:

- Maximum constituent concentrations were compared to residential screening levels (SL) using the sources and hierarchy described in the Multi-Site document, *Draft Risk Assessment Framework Addendum* (Exponent 2011). Those constituents with maximum concentrations above the residential SL were carried forward for further consideration as site-specific COPCs;
- The frequency of detection was determined for those chemicals that exceeded residential SLs to assess their prevalence on site. This criterion was used to evaluate whether the analytes detected above residential SLs would be carried forward as site-specific COPCs. The 5 percent (%) criterion used is a common supplemental criterion used in COPC selection within risk assessments (USEPA 1989); and
- Constituents that exceeded the residential SL with a frequency of detection less than 5% were not carried forward as potential COPCs unless a site-specific factor indicated that further evaluation was prudent. It should be noted that this criterion could only be used on portions of the site where soils have been well characterized already, and was not used for soil in other areas of the site or for groundwater where limited previous sampling has been completed.

Supplemental Site-Specific Soil COPC Evaluation

General Iron, AFS and PGL Parcels

The site-specific COPC screening process described above was performed for the General Iron, AFS and PGL parcels where significant remediation and soil investigation have already been completed. Summary statistics for constituents that exceed residential SLs in site soil are presented in Appendix F, Table F-1. If no results exceeded the SL for a constituent (e.g. beryllium in soil), that constituent is not listed in the table.

Both pentachlorophenol and PCBs were detected in soil at concentrations that exceeded the residential SLs, but had frequencies of detection equal to 1% or less and not considered site-specific COPCs for this reason. In addition to the low frequency of detection in soil for these two constituents, there was only a single exceedence of the residential screening level for each of the analytes, and the exceedence was slight (i.e., less than a factor of 2 greater than the screening criteria).

The only soil constituents that exceed the residential SLs and also have a frequency of detection greater than 5% at the Willow/Hawthorne OU are also constituents on the Multi-Site RAF COPC list, including:

- Volatile organic compounds (VOC) – Benzene and total xylenes;
- Polycyclic aromatic hydrocarbons (PAH) - Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and naphthalene; and
- Metals – Total antimony, total arsenic, total copper and total lead.

This analysis confirms the adequacy of the Multi-Site RAF COPC list as a screening tool for the General Iron, AFS and PGL parcels of the site. For future screening, those constituents listed above will be analyzed for in soil samples collected at the General Iron, AFS and PGL parcels of the site. In addition, all petroleum VOCs (PVOCs) and PAHs from the Multi-Site RAF COPC list will be retained as site-specific COPCs because they are typically the main risk drivers at MGP sites.

For the remaining properties included in the proposed RI work, there are the following considerations regarding site-specific COPCs for soil:

- As described previously, soil samples have not been collected in the past on the Marcey or ComEd parcels or off-property locations that have not been previously investigated;
- The Marcey and ComEd parcels have property-use histories that include an automobile garage (Marcey) and an electric power substation (ComEd) which could have contributed additional COPCs not on the Multi-Site RAF COPC list to the site (e.g. PCBs or solvents); and
- During remedial action on the AFS parcel, approximately 80 tons of PCB-impacted soil were excavated and disposed. Soil remaining on the AFS parcel no longer requires PCBs as a COPC based on confirmation soil sampling (see above analysis), but off-property sampling locations adjacent to the AFS parcel are proposed for the RI work.

Due to these known conditions at the Willow/Hawthorne OU, the parcels and properties not previously sampled or remediated will also be analyzed for site-specific COPCs.

Marcey Parcel

The Marcey parcel has not yet been sampled or investigated and has a property-use history that includes an automobile garage. Because it has not yet been investigated, the Marcey parcel will be analyzed for the full Multi-Site RAF COPC list; and because of the historic property use, which may have included the use of solvents and oils, soil on this parcel will be analyzed for an expanded list of VOCs (Target Compound List [TCL]) and PCBs.

ComEd Parcel

The ComEd parcel has not yet been sampled or investigated and has a property-use history that includes an electric power substation. Because it has not yet been investigated, the ComEd parcel will be analyzed for the full Multi-Site RAF COPC list; and because of the historic property use, which may have included the use PCB oils, soil on this parcel will also be analyzed for PCBs.

Off-Property Locations North of AFS Parcel

The off-property area north of the AFS parcel has not yet been sampled or investigated; has a property-use history that includes a solvent company and a gasoline service station; and was found to be impacted at the boundary with the AFS parcel during remediation of the AFS parcel. PCBs were found on the AFS parcel during remediation. Because it has not yet been investigated and is not located on the former MGP property, the area north of the AFS parcel will be analyzed for the site-specific list of MGP COPCs;

and because of the historic property use, which may have included the use of solvents and PCBs, soil on this parcel will be analyzed for an expanded list of VOCs (TCL) and PCBs.

Off-Property Locations South of General Iron Parcel

The off-property area south of the General Iron parcel has not yet been sampled or investigated. Because it is located adjacent to the remediated General Iron parcel, soil from this area will be analyzed for the same COPCs as the General Iron parcel. Soil from this area will be analyzed for the site-specific list of MGP COPCs.

A summary of site-specific soil COPCs for the Willow/Hawthorne OU is presented in Appendix F, Table F-2.

The expanded list of COPCs selected for the ComEd and Marcey parcels, and some off-property locations is intended to be used to evaluate soil quality on the OU, and not necessarily to define the extent of distribution of non-MGP contaminants.

Site-Specific Groundwater COPC Evaluation

A sufficiently large data set for groundwater does not currently exist to perform a supplemental COPC evaluation similar to soils. Five wells (three monitoring wells and two temporary piezometers) were installed and sampled one time each prior to site remediation. No groundwater samples have been collected since remediation. Based on what is known about site soils and groundwater, the site-specific COPCs for groundwater include:

- The site-specific MGP COPC list developed for on-property soils; and
- Total beryllium, the only groundwater constituent previously sampled that exceeded the residential SL and is not included in the site-specific MGP COPC list.

A summary of site-specific groundwater COPCs for the Willow/Hawthorne OU is presented in Appendix F, Table F-2.

The groundwater COPC list will be re-evaluated based on results from proposed soil sampling. Historic and new soil sampling results will be re-evaluated for COPCs as above, and groundwater COPCs will be modified to incorporate changes to the soil COPCs. In addition, for groundwater sampling events beyond the first two, groundwater analytical results will be evaluated to determine if the groundwater COPC list can be modified through the process put forth in the Multi-Site Conceptual Site Model (CSM). If an analyte does not exceed the residential SL for two rounds of sampling, it will be removed from the site-specific COPC list for groundwater.

Site-Specific Sediment and Surface Water COPC Selection

For sediment and surface water, the constituents list in the Multi-Site RAF COPC list will be carried forward as site-specific COPCs. In addition, per USEPA's suggestion, and because approximately 80 tons of PCB-impacted soil were excavated from the AFS parcel during previous site remediation, PCBs will be added to the site-specific sediment and surface water COPC lists (Appendix F, Table F-2).

Based on the results of the ambient sediment investigation, the site-specific sediment COPC list may be modified in a manner mutually agreed-upon with USEPA.

A summary of site-specific sediment and surface water COPCs for the Willow/Hawthorne OU is presented in Appendix F, Table F-2.

References

Exponent, 2011, "Draft Risk Assessment Framework Addendum," March.

U.S. EPA. 1989, "Risk assessment guidance for Superfund—Volume I: Human Health Evaluation Manual (Part A)," Interim final. EPA/540/1-89/002. U.S. Environmental Protection Agency, Office of Solid Waste and Remedial Response, Washington, DC.

Attachments:

Attachment F-1 Table 1 of the USEPA-approved Multi-Site Risk Assessment Framework (RAF) - MGP-related contaminants of potential concern, former MGP sites, EPA Region 5

Tables	Table F-1 – Summary Statistics for Soils on the General Iron, AFS and PGL Parcels
	Table F-2 – Site-Specific COPCs for Soil, Groundwater, Sediment and Surface Water

Attachment F-1

Table 1. MGP-related contaminants of potential concern, former MGP sites, EPA Region 5

PAHs	PVOCs	Inorganic Compounds	Acid Extractable Organic Compounds
Naphthalene	Benzene	Aluminum	2,4-Dimethylphenol
C1-Naphthalenes ^a	Ethylbenzene	Antimony	2-Methylphenol
C2-Naphthalenes ^a	Toluene	Arsenic	4-Methylphenol
C3-Naphthalenes ^a	Xylenes (Total)	Barium	Phenol
C4-Naphthalenes ^a	1,3,5-trimethylbenzene	Cadmium	
Acenaphthylene	1,2,4-trimethylbenzene	Chromium	
Acenaphthene		Copper	
Fluorene		Cyanide	
C1-Fluorenes ^a		Iron	
C2-Fluorenes ^a		Lead	
C3-Fluorenes ^a		Manganese	
Phenanthrene		Mercury	
Anthracene		Nickel	
C1-Phenanthrenes/Anthracenes ^a		Selenium	
C2-Phenanthrenes/Anthracenes ^a		Silver	
C3-Phenanthrenes/Anthracenes ^a		Vanadium	
C4-Phenanthrenes/Anthracenes ^a		Zinc	
Fluoranthene			
Pyrene			
C1-Fluoranthenes/Pyrenes ^a			
Benzo[a]anthracene			
Chrysene			
C1-Chrysenes ^a			
C2-Chrysenes ^a			
C3-Chrysenes ^a			
C4-Chrysenes ^a			
Benzo[b]fluoranthene			
Benzo[k]fluoranthene			
Benzo[e]pyrene			
Benzo[a]pyrene			
Perylene ^a			
Indeno[1,2,3-cd]pyrene			
Dibenzo[a,h]anthracene			
Benzo[g,h,i]perylene			
2-Methylnaphthalene			

Note: EPA - U.S. Environmental Protection Agency
PAH - polycyclic aromatic hydrocarbon
PVOC - petroleum volatile organic compounds

^a Additional PAHs to be analyzed in sediment only for comparison to *Equilibrium Partitioning Sediment Benchmarks* (U.S. EPA 2003).

Tables

Table F-1 – Summary Statistics for Soils on the General Iron, AFS and PGL Parcels

Willow/Hawthorne Former MGP Site

Site-Specific Work Plan

Analyte	Residential SL ^a (ug/kg)	[Min] (ug/kg)	[Max] (ug/kg)	No. Spl Results >Residential SL	Total Spls Analyzed	No. Spl Results >MDL	Frequency of Detection (%)	Min MDL (ug/kg)	Max MDL (ug/kg)
VOCs									
Benzene	1,100	6	25000	8	222	24	10.81	2	460
Xylenes, Total	630,000	6	980000	1	175	14	8.00	4.9	1700
SVOCs									
Pentachlorophenol	890	1100	1100	1	131	1	0.76	910	51000
PAHs									
Benzo(a)anthracene	150	28	290000	47	222	68	30.63	25	32000
Benzo(a)pyrene	15	32	230000	68	222	68	30.63	25	32000
Benzo(b)fluoranthene	150	31	170000	41	222	63	28.38	25	32000
Benzo(k)fluoranthene	1,500	35	140000	15	222	58	26.13	25	32000
Chrysene	15,000	30	190000	6	222	71	31.98	25	32000
Dibenz(a,h)anthracene	15	30	55000	41	222	41	18.47	25	32000
Fluoranthene	2,300,000	30	330000	0	222	80	36.04	25	32000
Indeno(1,2,3-cd)pyrene	150	35	140000	29	214	52	24.30	27	32000
Naphthalene	140,000	30	1200000	6	222	83	37.39	25	16000
Metals									
Antimony, Total	31,000	1200	180000	2	120	16	13.33	970	6100
Arsenic, Total ^b	13,000	209	67000	27	211	210	99.53	5800	5800
Copper, Total	3,100,000	2930	4100000	1	211	211	100.00	0	0
Lead, Total	400,000	6260	7200000	7	214	214	100.00	0	0
PCBs									
Aroclor-1242	NA	140	290	1	193	2	1.04	90	1000
Aroclor-1254	NA	150	360	1	193	2	1.04	90	2000

Table F-1 – Summary Statistics for Soils on the General Iron, AFS and PGL Parcels

Willow/Hawthorne Former MGP Site

Site-Specific Work Plan

NOTES:

Bolded percentages indicate analytes were detected above SL in more than 5% of the samples.

Background concentration of arsenic in metropolitan counties of IL is 13.0 mg/kg (IL TACO-Table G). Total arsenic screened against this background concentration.

^a Soil samples screened against the residential soil screening values in the IBS Multi-Site Screening Level Hierarchy.

^b Background concentration of arsenic in metropolitan counties of IL are 13.0 mg/kg (IL TACO-Table G). Total arsenic screened against background in this line.

[Max] - Maximum concentration

[Min] - Minimum concentration

MDL – Method detection limit

PAH - Polycyclic aromatic hydrocarbon

PCB - Polychlorinated biphenyl

SL - Screening level

SVOC - Semivolatile organic compound

ug/kg - Micrograms per kilogram

VOC - Volatile organic compound

Table F-2 – Site-Specific COPCs for Soil, Groundwater, Sediment and Surface Water
Willow/Hawthorne Former MGP Site
Site-Specific Work Plan

COPCs	Parcel/Property					
	Marcey parcel	ComEd parcel	Off-property locations north of AFS	Off-property locations south of General Iron	General Iron, AFS and PGL parcels	Adjacent River Area
Soil						
Site-Specific RAF COPC list ^a			X	X	X	
Multi-Site RAF COPC list ^b	X	X				
TCL VOCs	X		X			
PCBs	X	X	X			
Groundwater						
Site-Specific RAF COPC list ^a	X	X	X	X	X	
Total beryllium	X	X	X	X	X	
Sediment						
Multi-Site RAF COPC list ^c						X
PCBs						X
Surface Water						
Multi-Site RAF COPC list ^b						X
PCBs						X
Soil Gas						
Benzene	X	X	X	X	X	
Ethylbenzene	X	X	X	X	X	
Toluene	X	X	X	X	X	
Xylenes (total)	X	X	X	X	X	
1,2,4-Trimethylbenzene	X	X	X	X	X	
Naphthalene	X	X	X	X	X	
1,1,1-Trichloroethane	X	X	X	X	X	
1,1-Dichloroethane	X	X	X	X	X	
Acetone	X	X	X	X	X	
Carbon disulfide	X	X	X	X	X	
cis-Dichloroethene	X	X	X	X	X	
trans- Dichloroethene	X	X	X	X	X	
Methyl ethyl ketone	X	X	X	X	X	
Methylene chloride	X	X	X	X	X	
Styrene	X	X	X	X	X	
Tetrachloroethene	X	X	X	X	X	
Vinyl chloride	X	X	X	X	X	

Table F-2 – Site-Specific COPCs for Soil, Groundwater, Sediment and Surface Water
Willow/Hawthorne Former MGP Site
Site-Specific Work Plan

NOTES:

^a Site-Specific RAF COPC list includes: 17 PAHs and 6 PVOCs from the Multi-Site RAF COPC list, plus total antimony, total arsenic, total copper and total lead.

^b The Multi-Site RAF COPC list for sediment includes 34 PAHs, 6 PVOCs, 16 metals, cyanide, and 4 acid-extractable organic compounds. Complete list can be found Appendix F, Attachment F-1.

^c The Multi-Site RAF COPC list includes 17 PAHs, 6 PVOCs, 16 metals, cyanide, and 4 acid-extractable organic compounds. Complete list can be found Appendix F, Attachment F-1.

COPC - Contaminant of potential concern

PAH - Polycyclic aromatic hydrocarbon

PCB - Polychlorinated biphenyl

PGL - People's Gas, Power and Light

PVOC - Petroleum VOC

RAF - Risk Assessment Framework

TCL - Target Compound List

VOC - Volatile organic compound